

Storage Excerpts

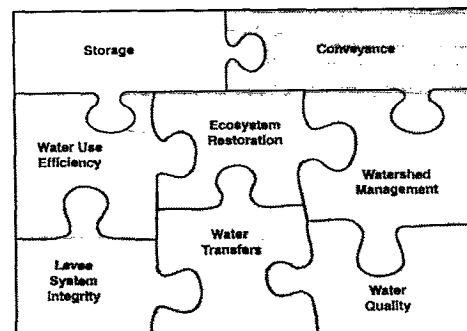
Proposed Changes to the Revised Phase II Report

December 8, 1998



Storage

Storage of water in surface reservoirs or groundwater basins can provide opportunities to improve the timing and availability of water for all uses. The benefits and impacts of surface and groundwater storage vary depending on the location, size, operational policies, and linkage to other Program elements. By storing during times of high flow and low environmental impact, more water is available for release for environmental and consumptive purposes during dry periods when conflicts over water supplies are critical. Properly managed, storage turns low value water into high value water for all uses.



Both groundwater and surface storage provide additional flexibility for managing water supplies, but there are differences in the potential operation of these two approaches to storage. Groundwater storage is generally viewed as having more benign on-site impacts to both environmental and other existing uses of the land. Depending on its operation, groundwater storage can also have significant water quality benefits. Finally, groundwater storage is generally less expensive than new surface storage facilities. On the other hand, surface storage can have flood control, power generation and regulation, and recreational benefits not generally available with groundwater storage. More importantly, surface storage is more suited to rapidly discharging or receiving large volumes of water, a distinct advantage in real-time management of high river flow periods or environmental storage releases.

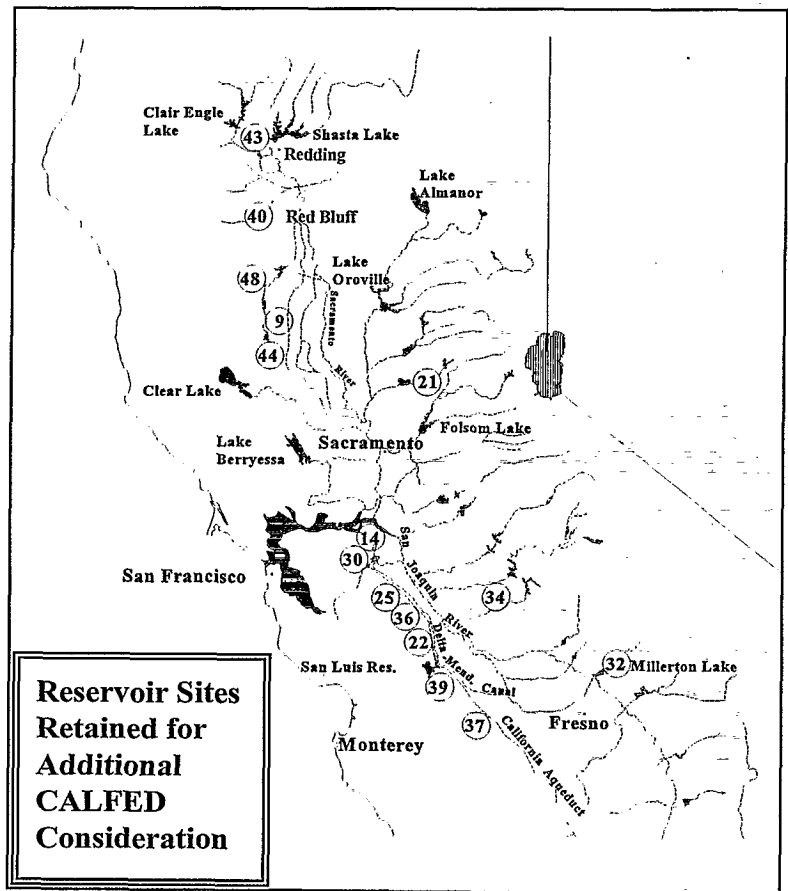
Considering the magnitude of conflicts over available water in California, CALFED believes that it must aggressively evaluate and implement all available water management options to ensure water supply reliability. Therefore, aggressive implementation of water conservation, recycling, and a protective water transfer market are critically important for effective water management. New surface and groundwater storage will be constructed as necessary, considering appropriate implementation of nonstructural programs and demonstrated willingness to pay by potential beneficiaries, to meet CALFED's program goals. During Stage 1, CALFED will evaluate and determine the appropriate mix of these water management tools.

Based on a programmatic evaluation of potential water supply benefits and practical consideration of acceptable levels of impacts and total costs, the range of total new storage considered for evaluation in Phase II was from zero up to about 6 MAF. This amount of new storage was considered a reasonable range for study purposes and impact analysis; more detailed study and significant interaction with stakeholders will be required before specific locations and sizes of new storage are proposed. However, most water supply benefits of Sacramento River off-stream storage are achieved with about 3 MAF of storage, while most water supply benefits of south of Delta off-aqueduct storage are attained with about 2 MAF of storage.

Other types of surface storage considered in Phase II include San Joaquin River tributary storage and in-Delta storage. Relatively smaller volumes of storage are practical for these types of storage facilities due to engineering considerations. Groundwater banking and conjunctive use in the Sacramento and San Joaquin Valleys were also considered in Phase II. The practical storage capacity available for groundwater storage in these areas will be determined only after detailed study of specific projects and full consideration of local concerns. For study purposes, groundwater storage volumes of 250 TAF in the Sacramento Valley and 500 TAF in the San Joaquin Valley were considered. Although significant additional work needs to be completed to identify groundwater storage opportunities, possible sites include Stockton East, an expanded Kern Water Bank, and the Madera Ranch project. In addition, there may be significant opportunities for enhanced surface and groundwater storage within service areas dependent on Delta water for some or all of their supplies.

CALFED will focus on off-stream reservoir sites for new surface storage, but will consider expansion of existing on-stream reservoirs. CALFED will not pursue storage at new on-stream reservoir sites. Under the ecosystem restoration program element, some dams and stream obstructions will be removed to open additional areas of fishery habitat. Even with new dams for surface storage, there will be fewer stream miles blocked in California with implementation of the CALFED Bay-Delta Program.

For the purposes of the programmatic Phase II evaluation, an inventory of fifty-two potential new surface storage projects was compiled. Those projects that appeared most feasible (see adjacent figure) were evaluated to provide representative information on costs and benefits. A more complete screening process for surface storage opportunities, taking into account engineering feasibility, potential environmental impacts, costs, and benefits, will proceed over the coming months and will be documented in a future report. While screening remains to be completed, among possible locations for additional surface storage are Sites Reservoir, a modestly enlarged Shasta Reservoir, and in-Delta storage CALFED has



narrowed the number of potential sites for additional CALFED consideration to the fifteen in the following table. These include potential sites to provide benefits for water supply, flood control, water quality, ecosystem, and other multiple purposes.

Reservoir Sites Retained for Additional CALFED Consideration (Retained for Future Evaluation and Screening)			
Project	Location	Type	Gross Storage Capacity
Colusa Reservoir Complex (Site 9)	Colusa/Glenn Counties Funks Creek	Off-Stream Storage	3,300 TAF
Garden Bar Reservoir (Site 21)	Sutter County Bear River	On-Stream Storage	245 TAF
Garzas Reservoir (Site 22)	Stanislaus County Garzas Creek	Off-Stream Storage	139 to 1,754 TAF
In-Delta Storage (Site 14)	Sacramento/San Joaquin Delta	Island Storage in the Delta	230 TAF
Ingram Canyon (Site 25)	Stanislaus County Ingram Creek	Off-Stream Storage	333 to 1,201 TAF
Los Vaqueros Enlargement (Site 30)	Contra Costa County Kellogg Creek	Off-Stream Storage	Additional 965 TAF
Millerton Lake Enlargement (Site 32)	Fresno County San Joaquin River	On-Stream Storage	Additional 720 TAF
Montgomery Reservoir (Site 34)	Stanislaus County Dry Creek	Off-Stream Storage	240 TAF
Orestimba Reservoir (Site 36)	Stanislaus County Orestimba Creek	Off-Stream Storage	380 to 1,140 TAF
Panoche Reservoir (Site 37)	Fresno County Silver Creek	Off-Stream Storage	160 to 3,100 TAF
Quinto Creek Reservoir (Site 39)	Merced/Stanislaus County Quinto Creek	Off-Stream Storage	332 to 381 TAF
Red Bank Project (Dippingvat- Schoenfield Project) (Site 40)	Tehama County S.F. Cottonwood Creek	Off-Stream Storage - Schoenfield Reservoir; On-Stream Storage - Dippingvat Reservoir	Schoenfield-250 TAF Dippingvat- up to 104 TAF
Shasta Lake Enlargement (6.5- foot raise of existing dam) (Site 43)	Shasta County Sacramento River	On-Stream Storage	Additional 290 TAF
Sites Reservoir (Site 44)	Colusa and Glenn Counties Funks & Stone Corral Cks	Off-Stream Storage	1,200 to 1,900 TAF
Thomes-Newville Reservoir (Site 48)	Glenn County Thomes & Stoney Creek	Off-Stream Storage	1,840 - 3,080 TAF

Of course, the relationship of water supply benefits to groundwater and surface storage volume is highly dependent on operating assumptions. Much more detailed information about specific locations of new storage, potential allocation of storage benefits, and operational goals and constraints would be necessary to determine an optimal volume of storage from a water supply perspective.

A fundamental principle of the CALFED Program is that the costs of a program should be borne by those who benefit from the program. That principle is especially relevant in the decision about new storage facilities. In principle, public money will be used to finance storage projects only to the extent that the storage creates public benefits; user money should be used to finance the portion of storage that generates user benefits. This "user pays" principle is critical to the overall CALFED goal of increasing the efficiency of water use in California. CALFED is performing economic analyses evaluating new facilities and other approaches (such as conservation, recycling, and transfers) to identify cost-effective pathways to meeting CALFED objectives. These economic analyses will be especially useful in assisting all potential users of new storage to evaluate the relative costs and benefits of particular storage options, as well as other ways of addressing reliability.

The following linkages and conditions will guide development of groundwater/conjunctive use and new surface water storage. Agency and stakeholder input is needed to make the linkages and conditions for new storage more specific, and to develop appropriate "bundels" of actions so that all CALFED goals progress together.

Groundwater/conjunctive use programs. Groundwater/conjunctive use programs will be constructed as necessary to meet CALFED's goals provided:

- a. Groundwater monitoring, and modeling programs are established
- b. Complete all environmental documentation and permitting requirements
- c. Demonstrated commitment to finance by beneficiaries
- d. Full recognition is given to the rights of landowners
- e. Guidelines are in place to protect resources, address local concerns, and avoid potential impacts prior to and during implementing implementation of a conjunctive management operation. The draft guidelines developed to date include address the following:
 - Funding support ~~will be provided~~ for local assessment of groundwater resources.
 - Conjunctive management programs will be voluntary.
 - The needs of landowners and users of local groundwater are protected.
 - Conjunctive management projects will be overseen by local agencies in partnership with other entities to assure that concerns are addressed through interest-based negotiation.
 - Groundwater withdrawals must be managed to avoid land subsidence ~~and~~.

- aquifer degradation, and ecosystem degradation.
- Consistency with local groundwater plans (such as AB3030 Plans) and City and/or County Comprehensive General Plans

Surface Storage. New or expanded surface storage will be constructed as necessary to meet CALFED's goals in conjunction with the following actions (all actions will be bundled so they move forward together):

- a. A high level of water use efficiency is achieved throughout the solution area.
- b. Demonstrated progress on the water transfer framework
- c. Demonstrated commitment to finance by beneficiaries
- d. Complete all environmental documentation and permitting requirements including completion of site specific Clean Water Act Section 404 compliance

CALFED seeks to plan for recreation enhancement and, if necessary, to mitigate impacts to Delta recreation resulting from CALFED activities designed to restore other Delta resources. Construction of new facilities will provide for appropriate on-site recreation development. The responsibilities and procedures for recreation development at new storage and other facilities is clearly addressed in current law. Federal and state laws and local laws and plans govern recreation developments associated with water development projects in and near the Delta. The Draft Programmatic EIS/EIR and accompanying technical reports address general impacts that CALFED Program implementation could have on recreational resources and on how the recreational resources could impact the other parts of the Program. The time line of such a process should be consistent with the Phase III documentation and implementation schedule, ensuring that recreation resources are appropriately considered as part of the Bay-Delta solution.

The CALFED Program has no specific objectives for hydropower generation. However, CALFED does seek to minimize negative impacts on resources, such as hydropower generation, during and after implementation. The Program may result in temporary or long-term changes in river and reservoir operations, which may affect the quantity, timing and value of hydropower produced within the Bay-Delta system. Also, additional pumping may increase the amount of Project Energy Use (power consumed by the CVP and the SWP to move water through the system). An increase in Project Energy Use can reduce the amount of surplus hydropower that might otherwise be available for sale from the CVP (necessary to repay Project debt), and may increase the amount of power that must be purchased from outside sources to meet SWP Project Energy Use. Replacement for reduced availability of renewable hydropower would likely come from fossil fuel or other thermal generation. CALFED is coordinating with the Western Area Power Administration to assure that issues are identified and properly framed, so consequences and options are clear to stakeholders, the public, and the CALFED decision-makers.